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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/023,220      | 12/20/2001  | Takahiro Saito       | 1417-375            | 2632             |

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EXAMINER

ASINOVSKY, OLGA NMN

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 10/23/2002

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Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
10/023,220

Applicant(s)  
Saito et al

Examiner  
Olga Asinovsky

Art Unit  
1711



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Dec 20, 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some\* c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s). 5 6) ☐ Other:

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## DETAILED ACTION

### 1. *Claim Rejections - 35 USC § 102 or 103*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2 The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-16 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Matyjaszewski et al U.S. Patent 6,407,187.

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The present independent claim 1 is a process for producing a methacrylate-based polymer, comprising: polymerizing a radical-polymerizable monomer containing at least one methacrylate-based monomer (d1) in the presence of a redox catalyst comprising a metal complex containing at least one transition metal as a central metal selected from the group consisting of elements of Groups 7 to 11 of the Periodic Table, such that a low-valence metal  $(M)^n$  and a high-valence metal  $(M)^{n+1}$  are both constituting the redox catalyst system (c1) in the specified ratio, using a solvent (a1), and a polymerization initiator (b1) selected from the group consisting of a halogen containing compound specified in the present independent claim 1.

Matyjaszewski discloses a polymerization process (atom transfer radical polymerization, or ATRP) based on a redox reaction between a transition metal Cu(I)/Cu(II) by providing a "living" or controlled radical polymerization of (meth)acrylates in the presence of an organo-halogen compound as a halogen atom transfer precursor (initiator), abstract; column 3, lines 21-35; column 9, lines 50-60; column 24, lines 42-50; column 25, lines 15-19 (for the claimed redox catalyst system having  $(M)^n$  and  $(M)^{n+1}$  metal complex). A redox catalyst system containing at least one transition metal as a central metal is disclosed in the reference at column 3, lines 21-35 and column 5, lines 35-40. Polymerizable (meth)acrylates and styrene are readable in the present claims, see column 8, lines 25-46. An organic solvent such as ethers can be present, column 12, line 3. A halogen containing initiator represented by the formula at column 8, line 50 and column

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16, lines 43-50, would be within the scope in applicants' claims. A block copolymer, multi-block, star, graft copolymer can be produced by a living polymerization such that the first monomer is consumed in the initial polymerization step, a second monomer can then be added to form a second block on the growing polymer chain in a second polymerizing step, column 14, lines 29-66, for the present claims. The (co)polymers have a low polydispersity index of 1.5 or less, column 17, lines 48-53, for the present claim 6. The "living" (co)polymer chains may retain end-functional group, column 17, lines 54-60 and column 28, lines 36-47, for the present claims 10-12. The end functionality includes Cl, column 18, lines 23-24, for the present claim 12.

Matyjaszewski discloses the analogous process for producing a methacrylate-based polymer comprising the applicants' claimed redox catalyst system and a polymerization initiator.

The difference between the present claims 1, 7 and 13 is the requirement that a molar ratio of a low-valence metal  $(M)^n$  to a high-valence metal  $(M)^{n+1}$  is 90/10 to 0.1/99.9. Reference discloses a process which provides a high degree of control over the polymerization process, column 4, lines 1-2. The set redox system will lead to obtain more uniform and more highly controllable product produced by living ionic polymerization process. It would have been obvious to one of ordinary skill in the art to use a process for producing a methacrylate-based (co)polymer disclosed by Matyjaszewski wherein a ratio of  $(M)^n$  to  $(M)^{n+1}$  can be selected in the applicants' claimed range of 90/10 to 0.1/99.9, if it is not inherent, in view of the identical use of the same set of redox system catalyst and in view of the same working mechanism of the set of  $(M)^n / (M)^{n+1}$ . In

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order to overcome this rejection under *In re Fitzgerald* 205 USPQ 594 the applicants should provide the evidence of difference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olga Asinovsky whose telephone number is (703) 308-0041. The examiner can normally be reached on Monday to Friday from 9am to 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck, can be reached on (703) 308-2462. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-7718 and (703)872-9311 after final.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

O.A.

O.A.

October 11, 2002

James J. Seidleck  
Supervisory Patent Examiner  
Technology Center 1700